

C. J. MESTA & S. E. DIESCHER.

DRYING SHEETS.

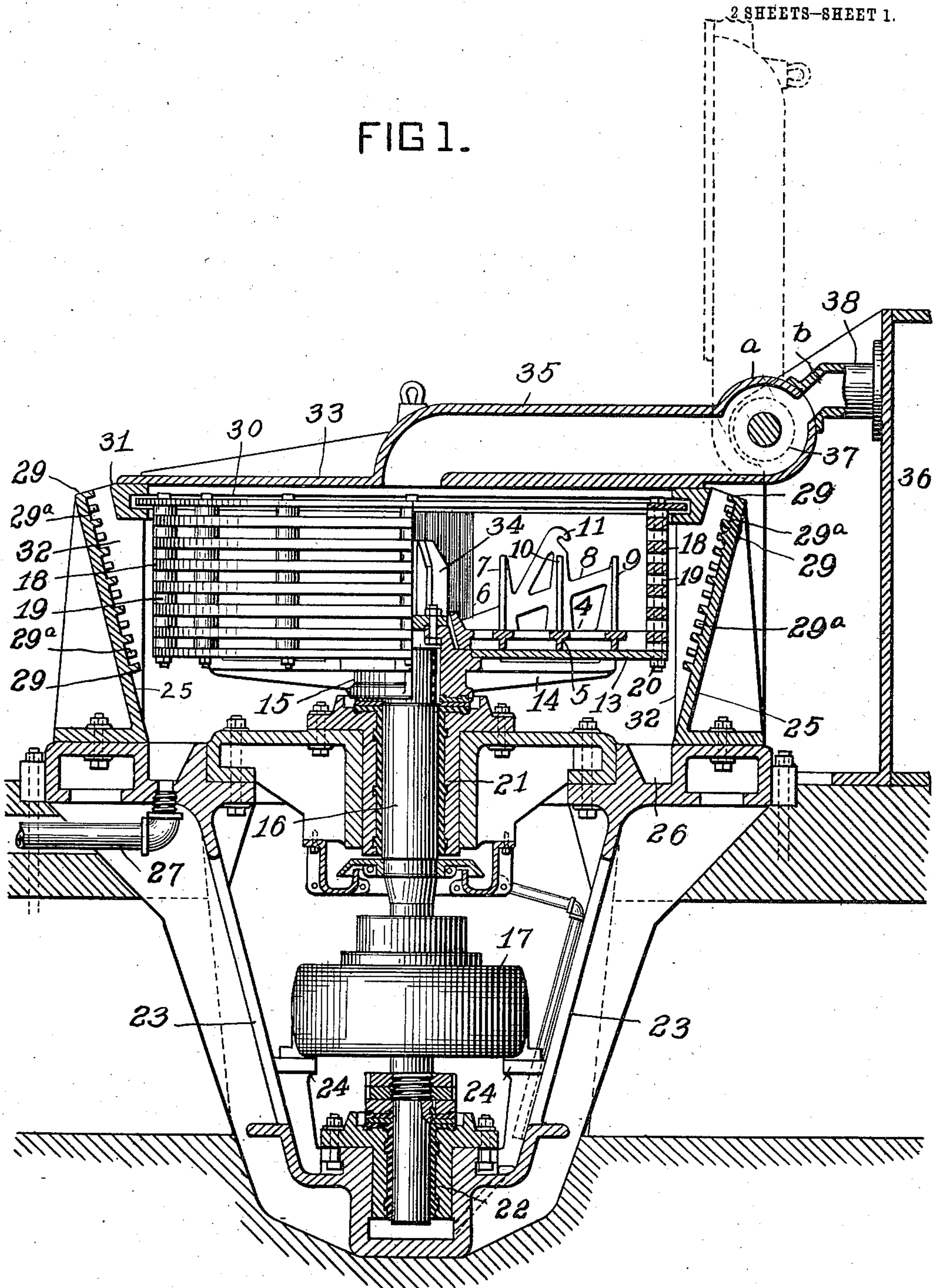
APPLICATION FILED MAR. 9, 1911.

1,011,072.

Patented Dec. 5, 1911.

2 SHEETS—SHEET 1.

FIG 1.



WITNESSES:

J. Herbert Bradley
Thomas Joyce

INVENTORS

Charles J. Mesta &
Samuel E. Diescher
by Saml B. Wolcott Atty

C. J. MESTA & S. E. DIESCHER.

DRYING SHEETS.

APPLICATION FILED MAR. 9, 1911.

1,011,072.

Patented Dec. 5, 1911.

2 SHEETS-SHEET 2.

FIG. 2.

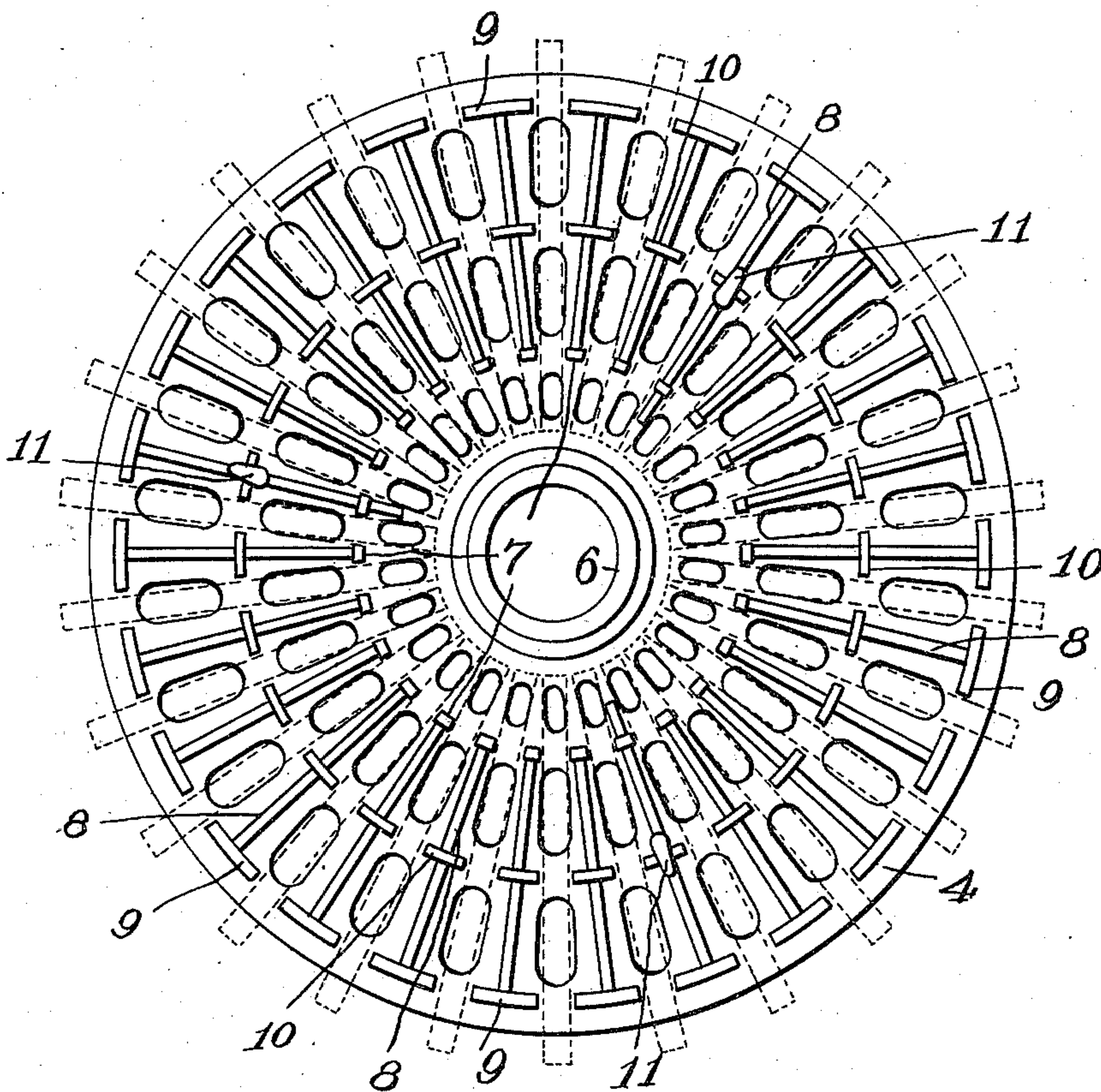
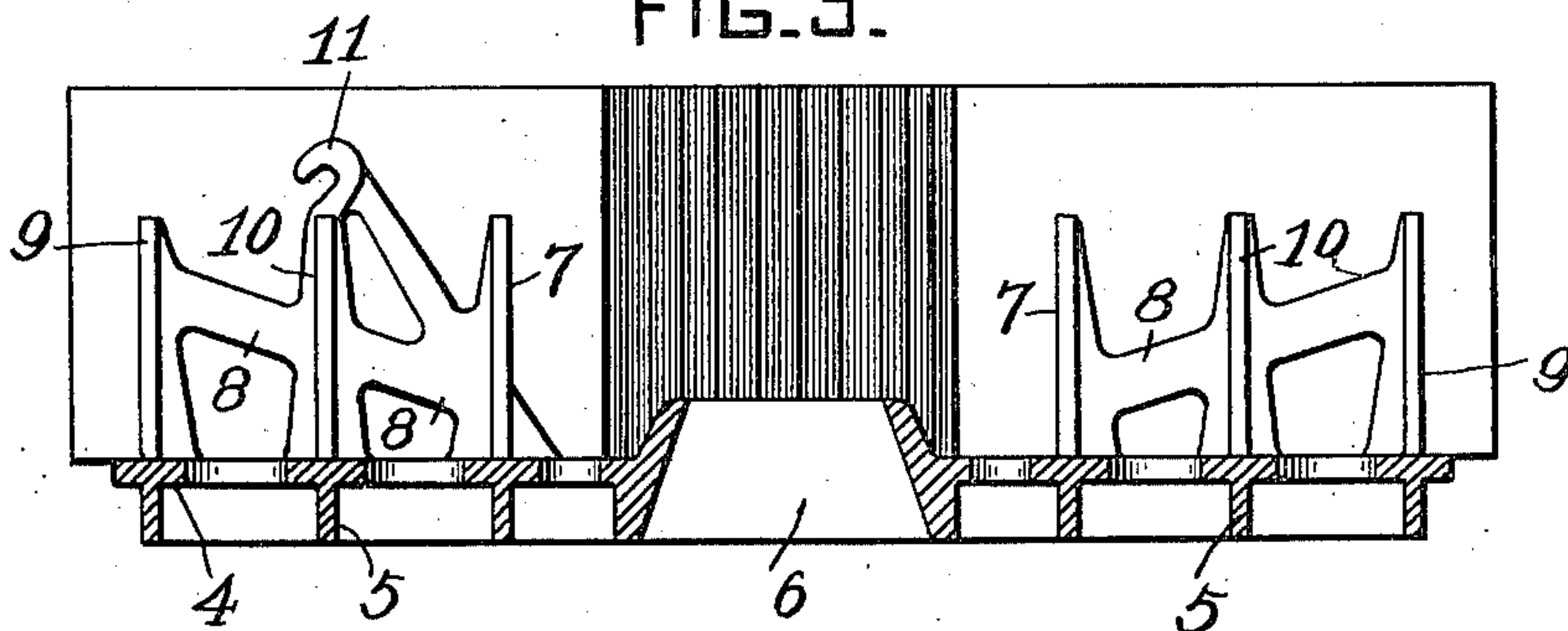


FIG. 3.



WITNESSES:

J. Herbert Bradley
Thomas Joyce

INVENTOR

Charles J. Mesta &
Samuel E. Diescher
by Samuel B. Wolest Atty

UNITED STATES PATENT OFFICE.

CHARLES J. MESTA AND SAMUEL E. DIESCHER, OF PITTSBURGH, PENNSYLVANIA.

DRYING SHEETS.

1,011,072.

Specification of Letters Patent.

Patented Dec. 5, 1911.

Original application filed November 10, 1910, Serial No. 591,508. Divided and this application filed March 9, 1911. Serial No. 613,390.

To all whom it may concern:

Be it known that we, CHARLES J. MESTA and SAMUEL E. DIESCHER, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, citizens of the United States, have invented or discovered certain new and useful Improvements in Drying Sheets, of which improvement the following is a specification.

10 The invention described herein relates to an improvement in drying metal sheets etc.

In an application filed October 12th, 1910, Serial No. 558552, is described and claimed a method of manufacturing sheets in which after being rolled to engage, the sheets are black pickled dried cold rolled etc the treatment of the sheets subsequent to the cold rolling being dependent upon the kind of sheets desired.

20 The invention described herein has for its object a form of apparatus for carrying out the method described and claimed in an application Serial No. 591508 filed November 10th, 1910, of which this case is a division.

The invention is hereinafter more fully described and claimed.

30 In the accompanying drawings forming a part of this specification Figure 1 is a sectional elevation of the drying apparatus, Fig. 2 is a plan view of the crate for sheets and Fig. 3 is a sectional elevation of the same.

The crate consists of an annular base 4 having radially arranged spacing partitions on its upper side and supporting ribs 5 on its under side. The base, radial partition, and ribs are preferably integral with each other being formed of cast metal. As in pickling and washing either the sheets or liquids are caused to move vertically relative to each other, numerous openings are formed through the base 4 for the free passage of the liquids. As the partitions are arranged radially and extend outward from the central eye 6 in the base, their outer ends are more widely separated than the inner ends, hence the partitions consisting of vertical posts 7 connected by transverse webs 8, are provided with lateral wings 9 and 10 for affording proper support for the sheets. These wings on adjacent partitions project toward each other such a distance that the

space between the ends of the wings on adjacent partitions will be approximately the same as that between the inner ends of the partitions, thereby affording sufficient lateral support for the packs of sheets when placed in position as shown in dotted lines in Fig. 2 and in full lines in Fig. 3. Three or more equally spaced partitions are provided with suitable means, as hooks 11, whereby the crates may be lifted.

After being thoroughly pickled and washed the sheets are subjected to such mechanical treatment as will remove to a very great extent if not entirely, all liquid from the surfaces of the sheets. The mechanical action may be supplemented by currents of air or gas which may be highly heated.

70 In the embodiment of the invention shown herein the liquid or moisture is removed by centrifugal action, the crate after removal from the washing vat being placed in a cage which can be rotated at such speed that practically all the moisture will be thrown off. If desired the liquid in the washing vat may be highly heated so that the sheets will be hot when placed in the centrifugal drier so that the heat of the sheets will cause the quick evaporation of any moisture not removed by centrifugal action.

While not limiting the invention as regards its broad features it is preferred to use a centrifugal machine of the character shown consisting of a circular cage having a closed bottom 13 supported by arms 14 radiating from a hub 15, which is keyed to a vertical shaft 16. This shaft may be rotated by any suitable means as for example by an elective motor indicated at 17. The outward movement barrier which is preferably secured to the bottom 13 of the cage but may be otherwise supported in position to prevent the dislodgment of the sheets or packs. This barrier may be constructed in any manner whereby it may perform its double function of preventing the dislodgment of the sheets and permitting of the passage of the liquid thrown off the sheets. A suitable construction for the purpose consists of a series of rings 18 suitably spaced by tubular blocks 19 through which pass bolts 20 whereby the rings are secured to the bottom 13 or other support.

The shaft 16 is supported by a bearing 21

and a stop 22 arranged in the frame 23 of the machine and the motor is also supported on brackets 24 formed on or secured to said frame. In order to catch the liquid which will be thrown off from the sheets, a circular shield 25 is placed around the cage, being secured to the frame of the machine. A gutter 26 is formed in the frame 23 at the lower edge of the shield for the reception of the liquid, which can escape from the gutter through the pipe 27. The cage with the radially arranged packs therein will act as a centrifugal fan, the air entering through the central opening formed by the inner ends of the packs and flowing out between the packs and sheets which operate as the blades of the fan. This movement of the air along the sheets will facilitate the removal of moisture especially if the air be heated. As evaporation will be approximately proportional to the rate of movement of the air flowing outward between the packs and sheets, provision should be made not only to prevent back pressure within the shield but to accelerate its flow from within the shield. This result can be effected in many ways as for example in the construction shown in Fig. 2 the shield 25 is inclined outwardly so that the space between the barrier and shield increases in width upwardly to an annular escape port 28. In order to prevent the liquid from passing out with the air through the port 28, several rows of staggered ribs or projections 29, 29^a are formed on the inner surface of the shield as shown in Figs. 1 and 2. To insure the flow of air into the central opening formed by the inner ends of the packs and thence between the packs, its flow into the space between the barrier and shield is retarded or wholly prevented by a flat annulus so secured to the barrier and projecting into a groove formed in a ring 31 carried by inwardly projecting ribs 32 on the shield as shown in Fig. 1. As a further means to insure the proper flow of air, especially when the same is heated as hereinafter described, a cover 33 is provided, said cover being supported when lowered by the ring 31 and provided with a central opening in line with the axis of rotation of the cage. An approximately even distribution of the air between the several packs is insured by a distributing cone 34 provided with radial ribs and secured on the hub of the cage.

To hasten the drying of the sheets and to insure the removal of the slight film of moisture which may not be dislodged by centrifugal action, it is preferred to heat the air which is caused to flow along the sheets by the fan action of the packs. To this end a pipe 35 extending from any suitable oven or furnace indicated at 36, is connected to the central opening in the cover 33. It is preferred that the pipe

should be secured to or made integral with the cover and that its outer end should form part of a hinge joint 37 connecting it to a pipe 38 leading from the air heating furnace. This joint is so constructed that when the cover is raised as shown in dotted lines the outlet from the pipe 38 is closed by a blank portion *a* of the hinge portion of the pipe 35. When the cover is lowered onto the cage a port *b* will connect the pipes 35 and 38. In the heater through which the air is drawn by the fan action of the packs, the air is heated above the vaporizing temperature of the liquid on the sheets so that by the rapid flow of the highly heated air the mechanical removal of the liquid is supplemented. As is well known to those skilled in the art it is very difficult to remove or neutralize by washing all the acid on the sheets. Such residual acid may however be evaporated if the air or gas be heated to or above the vaporizing temperature of the acid.

We claim herein as our invention:

1. In an apparatus for drying sheets, the combination of a cage, means for revolving the cage, and means for supporting a plurality of sheets around and in planes parallel with the axis of the cage.
2. In an apparatus for drying sheets, the combination of a cage, means for revolving the cage, means for supporting a plurality of sheets around and in planes parallel with the axis of the cage, and a barrier for preventing material radial movement of the sheets without interfering with the radial movement of liquid.
3. In an apparatus for drying sheets, the combination of a cage, means for revolving the cage, means for supporting the sheets around and in planes parallel with the axis of the cage, a barrier having openings therethrough arranged around the cage, and a shield outside of the barrier.
4. In an apparatus for drying sheets, the combination of a cage, means for revolving the cage, means for supporting the sheets around and in planes parallel with the axis of the cage, a barrier having openings therethrough for preventing material radial movement of the sheets, and means outside of the barrier for segregating the air and moisture and directing them away from each other.
5. In an apparatus for drying sheets, the combination of a cage, means for revolving the cage, means for supporting a plurality of sheets around and in planes parallel with the axis of the cage, means for directing air into the cage substantially in line with the axis of rotation, and means for preventing material radial movement of the sheets.
6. In an apparatus for drying sheets, the combination of a cage, means for revolving the cage, means for supporting a plurality

of sheets around and in planes parallel with the axis of the cage, means for directing air into the cage substantially in line with the axis of rotation and means for heating
5 the air.

7. In an apparatus for drying sheets the combination of means for supporting a plurality of sheets in a substantially radial position around a common center, means for
10 revolving the sheets around such center, and

means for evaporating moisture adherent to the sheets.

In testimony whereof, we have hereunto set our hands.

CHARLES J. MESTA.
SAMUEL E. DIESCHER.

Witnesses:

ALICE A. TRILL,
THOMAS JOYCE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."
